Welcome and Presentation of Charge

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Accelerator Advisory Committee Meeting
(http://www.fnal.gov/directorate/Fermilab_AAC_mtgs.htm)

May 10-12, 2006

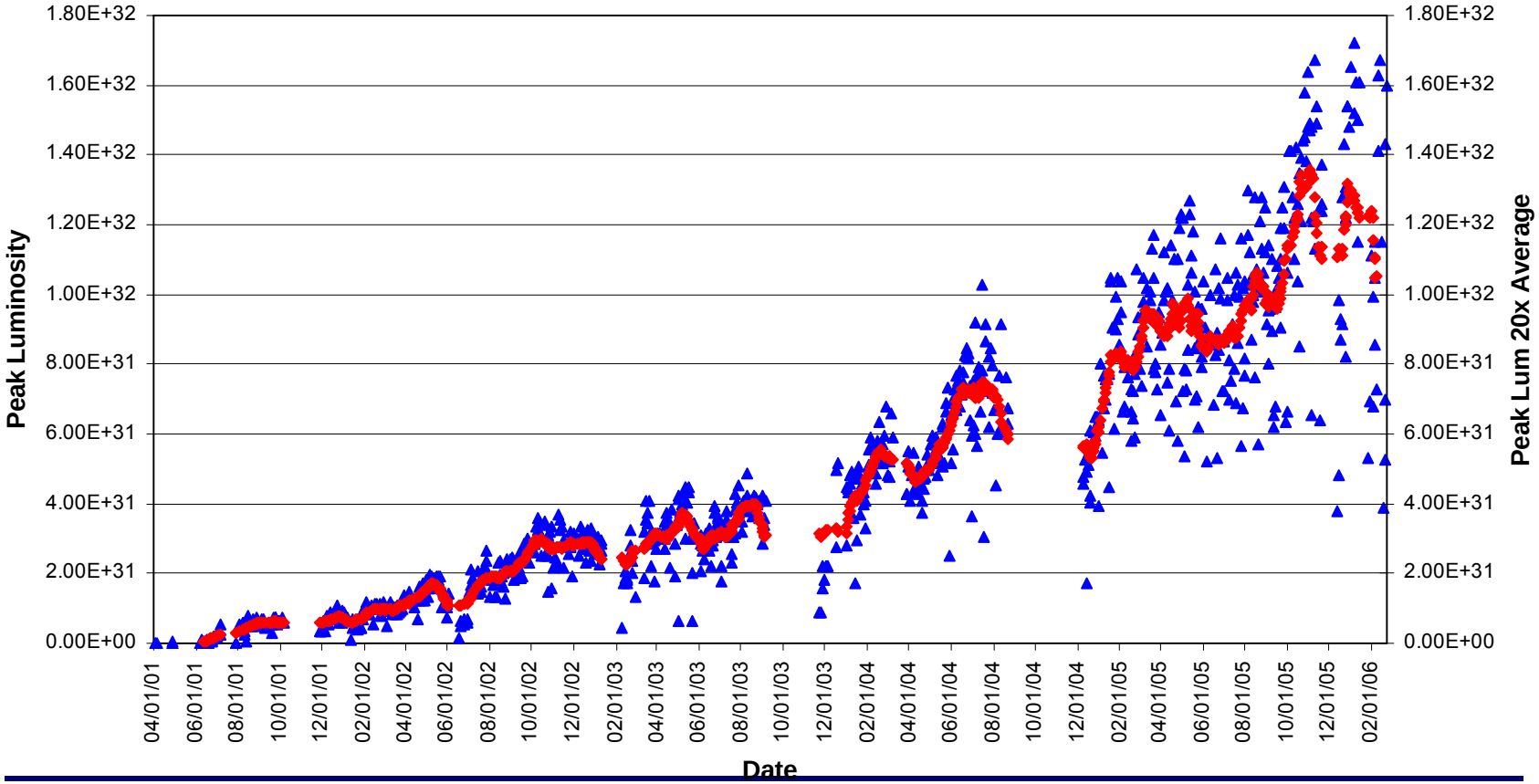
The Current Landscape:
Update Since May 2005 Meeting

- New Director! Pier Oddone, started July 1, 2005
- Run II
  - Successful integration of electron cooling into Recycler operations
    - Operations standard is now "Recycler only"
      - Up to 400 $\times 10^{10}$ antiprotons in Recycler
  - Significant improvement in the antiproton stacking rate
    - > 20 $\times 10^{10}$/hour
  - Typical store ~1.4$\times 10^{32}$ cm^{-2}sec^{-1}, record > 1.7$\times 10^{32}$ cm^{-2}sec^{-1}
    - 1.5 fb^{-1} (average CDF and D0) delivered in Run II to date
    - FY2006 initial luminosity performance is good, but integrated luminosity falling short due to three magnet failures
    - Currently finishing up 14 week major shutdown
  - Design goal (8 fb^{-1} through FY2009) requires 30 $\times 10^{10}$/hour stack rate and 600 $\times 10^{10}$ Recycler stack

$\Rightarrow$**Currently planning 9/30/09 cessation of operations**

The Current Landscape

Initial Luminosity (through 2/27/06)

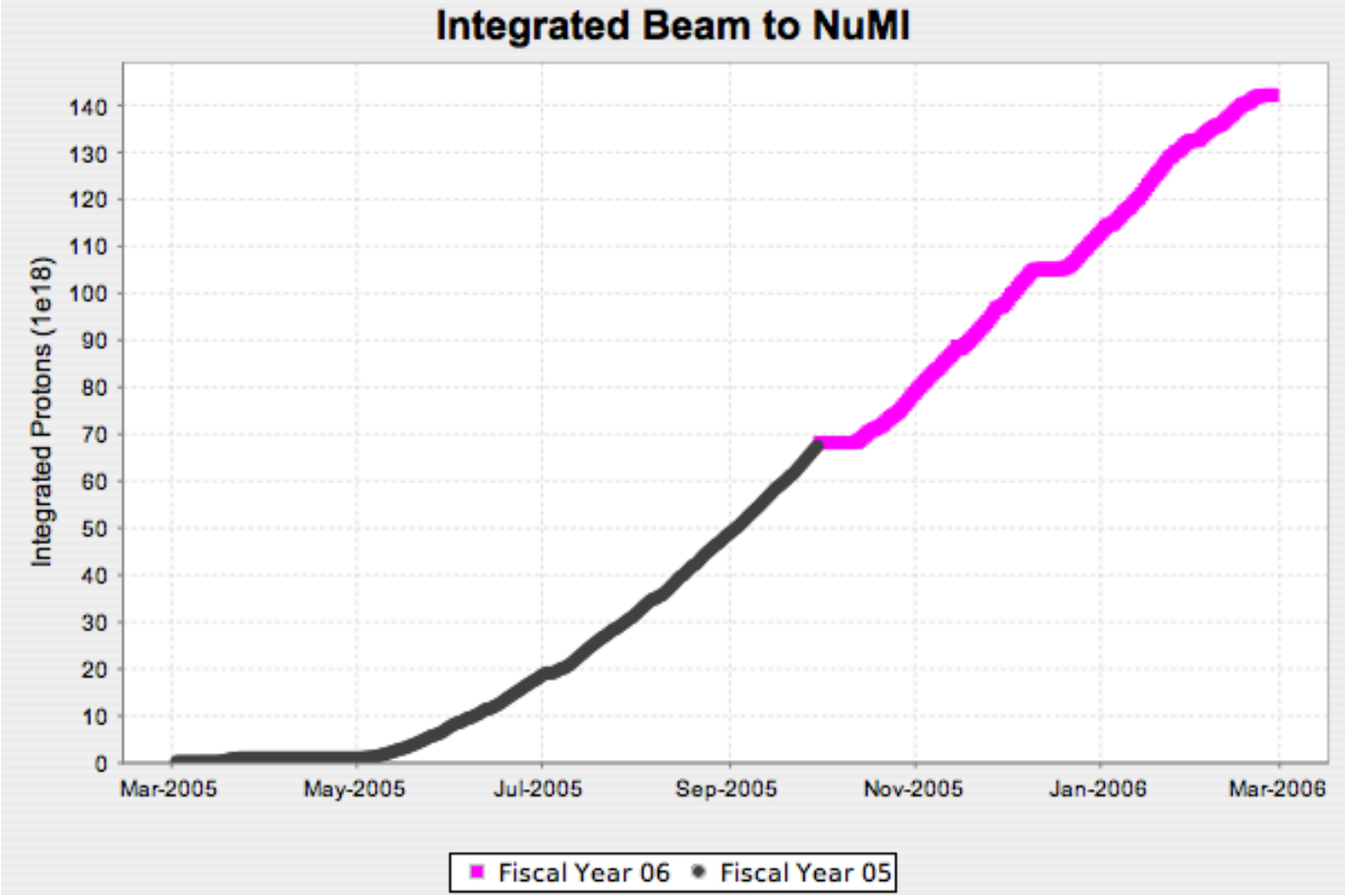


The Current Landscape:
Update Since May 2005 Meeting

- Neutrinos
  - MiniBoone now at 7.2E20 protons on target
    - Approved for running through FY2006
    - Fermilab intention is to keep the Booster Neutrino Beam (BNB) available for future experiments
  - NuMI operations initiated in February 2005
    - Now beyond 1.4E20 on target
      - Corresponds to ~200-240 kW (concurrent with antiproton production)
    - Observation of neutrino oscillations; Δm^2 measurement
    - Proton Plan baselined and underway
    - Goal: 400 kW on target simultaneous with antiproton production

The Current Landscape

Integrated Beam to NuMI (through 2/27/06)



The Current Landscape:
Update Since May 2005 Meeting

- Neutrinos
  - Nova
    - Follow-on experiment to MINOS based on large (>25 kTon) off-axis detector
    - Successful CD-1 review in March 2006
    - "SuperNuMI" Plan in development for the post-Run II era
    - Goal: 700 - 1000 kW on target utilizing accelerator assets freed up by the end of Run II (Recycler and Accumulator)

The Current Landscape:
Update Since May 2005 Meeting

- The Future
  - EPP2010 report is strongly supportive of Fermilab's vision for the future
    - (Briefing to Fermilab staff on Friday, May 12, at 1:30)
  - ILC effort is clearly established as laboratory priority
    - Very significant increase + redirection of resources into this activity
  - No CD-1 for Proton Driver

    ⇒ Reorientation of the R&D program: "Develop/demonstrate critical technology elements that could enable construction of a very high intensity (>2 MW) neutrino source when married to ILC technologies."
    - Focus on 100 MeV test facility in Meson Lab
      - Acceleration of beam with spoke resonators
      - rf distribution system for powering multiple structures off a single klystron
    - Also:
      - 8 GeV H^- beam transport and MI injection
      - Intensity limitations in the Main Injector
      - Targeting 2 MW beam power

With ANL, BNL, LBNL, MSU (JLab, SLAC)

Charge to the Committee:
Context

- Essentially all elements of the Fermilab accelerator R&D program are now subject to periodic external review
  - Was not true when AAC established in 1999
- Expect to use the AAC to look at high level strategic issues and to fill in some of the gaps, in particular those that cut across multiple programs. For this review:
  - Evolution of neutrino capabilities utilizing the existing complex
  - Reorientation of the Proton Driver R&D effort and potential synergies with other (Office of Science) programs
- Meeting frequency now 1/year

Charge to the Committee
(Rev. 3)

The Fermilab Accelerator Advisory Committee is asked to focus in its May 2006 meeting on efforts aimed at developing the Fermilab neutrino programs beyond the 2009 end of Run II, and the opportunities for aligning these efforts with the ILC program. Three primary topics will be discussed:

Charge to the Committee
(cont.)

Proton Improvement Plan and its immediate follow-ons

The Proton Improvement Plan has been established, and work has started, with the goal of achieving up to 400 kW of beam power delivered to the NuMI target simultaneous with antiproton production for Run II. Following the completion of Run II certain assets will become available for the utilization in the neutrino program, and concepts are being developed for extending performance of the Main Injector complex to approximately 1 MW.

The committee is asked to review the plan for evolution of the neutrino complex from the present time through and beyond the end of Collider Run II and offer comments and recommendations relative to strategy, technical feasibility, and planning and execution.

Charge to the Committee
(cont.)

High Intensity Neutrino Source R&D

A possibility that has been discussed extensively for the longer term future neutrino program is the development of a >2 MW neutrino source based on a superconducting H^- linac. Fermilab's approach has been modified over the last year to align this effort more closely with the laboratory's ILC strategy.

The committee is asked to review and offer comments and recommendations relative to the current plan, strategy, and development status of R&D in support of a High Intensity Neutrino Source.

Charge to the Committee
(cont.)

High Intensity Neutrino Source Synergies

Identification of possible synergies, or multiple use applications, of technologies developed within the HINS R&D program could provide a cost effective means of advancing multiple options for Fermilab and/or the Office of Science. The most discussed synergy involves the β=1 superconducting linac that serves as the basis of both the ILC and HINS. However, other possibilities, while not developed in detail, may exist.

We would like to engage the committee in discussion on possible strategies to maximize mutual benefit to the HINS and other programs. This discussion will include:

- Possible synergies with the ILC
- Possible utilization of the HINS in support of a muon storage ring
- Possible connections with other Office of Science programs

We are interested in any reaction or advice the committee would provide in these areas.

Charge to the Committee
(cont.)

Fine Print

As usual the committee is invited to issue comments or suggestions on any aspect of the programs discussed beyond those specifically included in this charge. It is requested that a concise report responsive to this charge be forwarded to the Fermilab Director by June 15, 2005. Thank you.